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Search Results - Record(s) 1 through 6 of 6 returned.

☐ 1. Document ID: US 6377047 B1

L13: Entry 1 of 6

File: USPT

Apr 23, 2002

US-PAT-NO: 6377047

DOCUMENT-IDENTIFIER: US 6377047 B1

TITLE: Superconducting birdcage coils

DATE-ISSUED: April 23, 2002

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Wong; Wai Ha	San Jose	CA		
Romo; Marco A.	Castro Valley	CA		

ASSIGNEE-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY	TYPE CODE
Varian, Inc.	Palo Alto	CA			02

APPL-NO: 09/589847 [PALM]

DATE FILED: June 8, 2000

INT-CL-ISSUED: [07] G01V 3/00

INT-CL-CURRENT:

TYPE IPC

DATE

CIPP G01 R 33/34 20060101

US-CL-ISSUED: 324/318; 324/322

US-CL-CURRENT: 324/318; 324/322

FIELD-OF-CLASSIFICATION-SEARCH: 324/318, 324/319, 324/320, 324/321, 324/322, 324/309

See application file for complete search history.

PRIOR-ART-DISCLOSED:

U.S. PATENT DOCUMENTS

PAT-NO	ISSUE-DATE	PATENTEE-NAME	US-CL
<u>4694255</u>	September 1987	Hayes	324/318
<u>5258710</u>	November 1993	Black et al.	324/309
<u>5276398</u>	January 1994	Withers et al.	324/318
<u>5351007</u>	September 1994	Withers et al.	324/322
<u>5565778</u>	October 1996	Brey et al.	324/318
<u>5585723</u>	December 1996	Withers	324/318
<u>5594342</u>	January 1997	Brey et al.	324/322
<u>5619140</u>	April 1997	Brey et al.	324/318
<u>5974335</u>	October 1999	Talisa et al.	
<u>6121776</u>	September 2000	Marek	
<u>6285189</u>	September 2001	Wong	324/318

FOREIGN PATENT DOCUMENTS

FOREIGN-PAT-NO	PUBN-DATE	COUNTRY	CLASS
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1096266
WO 94/05022

May 2001
March 1994

EP
WO

OTHER PUBLICATIONS

Conference Abstract by Wong, W.H. et al., entitled "'Millipede" Imaging Coil Design for High Field Micro Imaging Applications", published by Proc. Intl. Soc. Mag. Reson. Med. 8th Scientific Meeting and Exhibition, Denver, Colorado, USA, 1-7, Apr. 2000, vol. 2., p. 1399.

Article by Okada, H. et al., entitled "RF Coil for Low-Field MRI Coated With High-Temperature Superconductor", published by Journal of Magnetic Resonance, Series B, vol. 107, pp. 158-164, May 1995.

Article by Wen, H., entitled "The Design and Test of a New Volume Coil for High Field Imaging", published by Magnetic Resonance in Medicine, vol. 32, pp. 492-498 (1994).

Article by Vullo et al., entitled "Experimental Design and Fabrication of Birdcage Resonators for Magnetic Resonance Imaging" published in Magnetic Resonance in Medicine, vol. 24, pp. 243-252 (1992).

Article by Wen et al., entitled "Experimental Design and Fabrication of Birdcage Resonators for Magnetic Resonance Imaging" published in MRM, vol. 32, pp. 492-498 (1994).

ART-UNIT: 2862

PRIMARY-EXAMINER: Lefkowitz; Edward

ASSISTANT-EXAMINER: Fetzner; Tiffany A.

ATTY-AGENT-FIRM: Fishman; Bella

ABSTRACT:

Superconducting birdcage coil with low-pass and high-pass coil configurations are formed by using strips each with an elongated sapphire substrate with a layer of a high temperature superconductor (HTS) material grown in a wavy pattern over its entire length on one of its main surfaces. A low-pass coil is formed with a pair of ring elements made of an electrically conductive metal and a plurality of such strips arranged parallel to one another and interconnecting these ring elements at junctions which are spaced peripherally along each of the rings. At each of the junctions, the ring element and the HTS layer form a capacitance. A highpass coil is formed by a plurality of such strips each with electrodes of the HTS material also grown at two end positions separated from each other on the other main surface of its sapphire substrates. These strips are arranged parallel to each other and sequentially around a central axis, each lying in a plane which includes the center axis. The electrodes and the HTS layers on mutually

adjacent pairs of strips are closely in face-to-face relationship so as to serve as the ring part of a birdcage configuration containing capacitors.

18 Claims, 14 Drawing figures

Full	Title	Citation	Front	Review	Classification	Date
Reference	Abstract	Claims	KMC	Draw Desc	Image	

☐ 2. Document ID: US 5619140 A

L13: Entry 2 of 6

File: USPT

Apr 8, 1997

US-PAT-NO: 5619140

DOCUMENT-IDENTIFIER: US 5619140 A

TITLE: Method of making nuclear magnetic resonance probe coil

DATE-ISSUED: April 8, 1997

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Brey; William W.	Sunnyvale	CA		
Johansson; Marie E.	Palo Alto	CA		
Withers; Richard S.	Sunnyvale	CA		

ASSIGNEE-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY	TYPE CODE
Conductus, Inc.	Sunnyvale	CA			02

APPL-NO: 08/461558 [PALM]

DATE FILED: June 5, 1995

PARENT-CASE:

CROSS-REFERENCE TO RELATED APPLICATIONS This application is a continuation-in-part of U.S. patent application Ser. No. 08/409,506 by Richard S. Withers filed Mar. 23, 1995, now U.S. Pat. No. 5,585,723, and

a continuation-in-part of U.S. patent application Ser. No. 08/313,624 by Richard S. Withers, Guo-Chun Liang and Marie Johansson filed Sep. 27, 1994, now abandoned, which is a continuation-in-part of 891,591, U.S. Pat. No. 5,351,007 by Richard S. Withers and Guo-Chun Liang filed Jun. 1, 1992, each of which is incorporated herein by reference.

INT-CL-ISSUED: [06] G01V 3/00

INT-CL-CURRENT:

TYPE IPC	DATE
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CIPS <u>G01</u> R <u>33/36</u>	20060101
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CIPS <u>G01</u> R <u>33/34</u>	20060101
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CIPS <u>G01</u> R <u>33/32</u>	20060101
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CIPS <u>H01</u> G <u>4/40</u>	20060101
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US-CL-ISSUED: 324/318; 29/593

US-CL-CURRENT: 324/318; 29/593

FIELD-OF-CLASSIFICATION-SEARCH: 29/593, 29/599, 29/600, 29/601, 29/847, 324/318, 324/322, 324/300, 128/653.5

See application file for complete search history.

PRIOR-ART-DISCLOSED:

U.S. PATENT DOCUMENTS

PAT-NO	ISSUE-DATE	PATENTEE-NAME	US-CL
<u>4346537</u>	August 1982	Masujima et al.	29/593
<u>4769883</u>	September 1988	Nathanson et al.	29/847
<u>4783641</u>	November 1988	Hayes et al.	324/318
<u>4894316</u>	January 1990	Hjulstrom	29/847
<u>5172461</u>	December 1992	Pichl	29/847

FOREIGN PATENT DOCUMENTS

FOREIGN-PAT-NO PUBN-DATE COUNTRY CLASS

WO94/05022 March 1994 WO

ART-UNIT: 225

PRIMARY-EXAMINER: Arana; Louis M.

ATTY-AGENT-FIRM: DeFranco, Esq.; Judith A.

ABSTRACT:

A method of making a an NMR coil is provided. A coil is patterned of a film of a conductive material on a substrate. The coil mask is designed so that the resultant coil will have a lower resonant frequency than the desired frequency of the final coil. The coil is placed in an apparatus where it is exposed to increasing current, preferably within a magnetic field such as will be used during operation. The current is gradually increased and the coil observed for changes in its resonant frequency. When the coil is exposed to its operating current without further change in its resonant frequency, it is trimmed by removal of part of the capacitive element of the coil to the desired frequency.

7 Claims, 21 Drawing figures

Full	Title	Citation	Front	Review	Classification	Date
Reference				Claims	KMC	Draw Desc Image

☐ 3. Document ID: US 5594342 A

L13: Entry 3 of 6

File: USPT

Jan 14, 1997

US-PAT-NO: 5594342

DOCUMENT-IDENTIFIER: US 5594342 A

TITLE: Nuclear magnetic resonance probe coil with enhanced current-carrying capability

DATE-ISSUED: January 14, 1997

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Brey; William W.	Sunnyvale	CA		
Withers; Richard S.	Sunnyvale	CA		

ASSIGNEE-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY	TYPE CODE
Conductus, Inc.	Sunnyvale	CA			02

APPL-NO: 08/462663 IPALM1

DATE FILED: June 5, 1995

PARENT-CASE:

CROSS-REFERENCE TO RELATED APPLICATIONS This application is a continuation-in-part of U.S. patent application Ser. No. 08/409,506 by Richard S. Withers filed Mar. 23, 1995, and a continuation-in-part of U. S. patent application Ser. No. 08/313,624 by Richard S. Withers, Guo-Chun Liang and Marie Johansson filed Sep. 27, 1994 now abandoned, which is a continuation-in-part of Ser. No. 891,591, now U.S. Pat. No. 5,351,007 by Richard S. Withers and Guo-Chun Liang filed Jun. 1, 1992, each of which is incorporated herein by reference.

INT-CL-ISSUED: [06] G01V 3/00

INT-CL-CURRENT:

TYPE IPC	DATE
CIPS <u>G01</u> R <u>33/36</u> 20060101	
CIPS <u>G01</u> R <u>33/34</u> 20060101	
CIPS <u>G01</u> R <u>33/32</u> 20060101	
CIPS <u>H01</u> G <u>4/40</u> 20060101	

US-CL-ISSUED: 324/322; 324/318

US-CL-CURRENT: 324/322; 324/318

FIELD-OF-CLASSIFICATION-SEARCH: 324/318, 324/321, 324/322, 29/829, 29/846, 29/847, 505/192, 505/202, 505/220, 505/329, 505/844

See application file for complete search history.

PRIOR-ART-DISCLOSED:

U.S. PATENT DOCUMENTS

PAT-NO	ISSUE-DATE	PATENTEE-NAME	US-CL
<u>2657310</u>	October 1953	Runft	250/33
<u>3764938</u>	October 1973	Barnes	331/96
<u>4346537</u>	August 1982	Masujima et al.	51/413
<u>4409608</u>	October 1983	Yoder	357/51
<u>4636730</u>	January 1987	Bottomly	324/318
<u>4769883</u>	September 1988	Misic et al.	128/653.5
<u>4792790</u>	December 1988	Reeb	29/846
<u>4872068</u>	October 1989	Huang et al.	361/321
<u>4894316</u>	January 1990	Hjulstrom	430/316
<u>4894629</u>	January 1990	Okamura et al.	333/177
<u>4981838</u>	January 1991	Whitehead	505/1
<u>5061686</u>	October 1991	Ruby	565/1
<u>5075281</u>	December 1991	Testardi	505/1
<u>5172461</u>	December 1992	Pichl	29/25.42
<u>5219827</u>	June 1993	Higaki et al.	505/1
<u>5231078</u>	July 1993	Riebman et al.	505/192
<u>5247256</u>	September 1993	Marek	324/321
<u>5258710</u>	November 1993	Black et al.	324/309
<u>5276398</u>	January 1994	Withers et al.	324/318
<u>5351007</u>	September 1994	Withers et al.	324/322

FOREIGN PATENT DOCUMENTS

FOREIGN-PAT-NO	PUBN-DATE	COUNTRY	CLASS
WO94/05022	March 1994	WO	

OTHER PUBLICATIONS

Gupta, et al., Computer-Aided Design of Microwave Circuits, ARTECH House, Inc. 217-220 (1981).
Banson, et al., "A probe for specimen magnetic resonance microscopy" (Feb. 1992). Investigative Radiology27:157-164.
Black, et al., "A high-temperature superconducting receiver for nuclear magnetic resonance microscopy" (Feb. 5 1993) Science259:793-795.

ART-UNIT: 225

PRIMARY-EXAMINER: Arana; Louis M.

ATTY-AGENT-FIRM: DeFranco; Judith A.

ABSTRACT:

The conductive material in an RF coil disposed in the polarizing field of an NMR apparatus in miminized and the current density at each point in the coil kept constant by providing an inductive element and a set of tapered, interidigtated capacitors having a uniform gap therebetween. The invention maximizes the current-carrying capacity of the coil.

18 Claims, 22 Drawing figures

Full	Title	Citation	Front	Review	Classification	Date
Reference				Claims	KMC	Draw Desc Image

☐ 4. Document ID: US 5585723 A

L13: Entry 4 of 6

File: USPT

Dec 17, 1996

US-PAT-NO: 5585723

DOCUMENT-IDENTIFIER: US 5585723 A

TITLE: Inductively coupled superconducting coil assembly

DATE-ISSUED: December 17, 1996

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Withers; Richard S.	Sunnyvale	CA		

ASSIGNEE-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY	TYPE CODE
Conductus, Inc.	Sunnyvale	CA			02

APPL-NO: 08/409506 IPALM1

DATE FILED: March 23, 1995

INT-CL-ISSUED: [06] G01V 3/00

INT-CL-CURRENT:

TYPE IPC	DATE
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CIPP G01 R 33/34 20060101

US-CL-ISSUED: 324/318; 324/322

US-CL-CURRENT: 324/318; 324/322

FIELD-OF-CLASSIFICATION-SEARCH: 324/318, 324/321, 324/322, 29/829, 29/846, 29/847, 505/192, 505/202, 505/220, 505/329, 505/844

See application file for complete search history.

PRIOR-ART-DISCLOSED:

U.S. PATENT DOCUMENTS

PAT-NO	ISSUE-DATE	PATENTEE-NAME	US-CL
<u>5003265</u>	March 1991	Leussler	324/318

<u>5247256</u>	September 1993	Marek	324/321
<u>5258710</u>	November 1993	Black et al.	324/309
<u>5274332</u>	December 1993	Jaskolski et al.	324/318
<u>5276398</u>	January 1994	Withers et al.	324/318

OTHER PUBLICATIONS

Banson, et al., "A probe for specimen magnetic resonance microscopy" (1992) Invest. Radiol. 27:157-164.

Johnson, et al., "Histology by Magnetic Resonance Microscopy" (1993) Magnetic Resonance Quarterly 9:(1) 1-30.

ART-UNIT: 225

PRIMARY-EXAMINER: Arana; Louis M.

ATTY-AGENT-FIRM: DeFranco; Judith A.

ABSTRACT:

The invention provides highly sensitive NMR probes for spectroscopy and microscopy. Thin-film superconducting coils on planar substrates are inductively coupled to form an RF transmitter/receiver. Two embodiments are illustrated. The first, which is particularly suited to liquid samples, uses two coils are positioned on opposite sides of a sample, with their long axis parallel to the axis of the sample. The coils are sized and positioned to maximize SNR, field homogeneity or field strength. In the second embodiment, circular coils are deposited on a substrate having a central aperture. Several coils in a solenoidal configuration are positioned orthogonal to and surrounding the sample.

11 Claims, 8 Drawing figures

Full	Title	Citation	Front	Review	Classification	Date
Reference				Claims	KWIC	Draw Desc Image

☐ 5. Document ID: US 5565778 A

L13: Entry 5 of 6

File: USPT

Oct 15, 1996

US-PAT-NO: 5565778

DOCUMENT-IDENTIFIER: US 5565778 A

TITLE: Nuclear magnetic resonance probe coil

DATE-ISSUED: October 15, 1996

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Brey; William W.	Sunnyvale	CA		
Anderson; Weston A.	Palo Alto	CA		
Wong; Wai H.	Monterey Park	CA		
Fuks; Luiz F.	Fremont	CA		
Kotsubo; Vincent Y.	Sunnyvale	CA		
Withers; Richard S.	Sunnyvale	CA		

ASSIGNEE-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY	TYPE CODE
Conductus, Inc.	Sunnyvale	CA			02

APPL-NO: 08/461559 IPALM1

DATE FILED: June 5, 1995

PARENT-CASE:

CROSS-REFERENCE TO RELATED APPLICATIONS This application is a continuation-in-part of U.S. patent application Ser. No. 08/409,506, by Richard S. Withers filed Mar. 23, 1995, and a continuation-in-part of U.S. patent application Ser. No. 08/313,624, by Richard S. Withers, Guo-Chun Liang and Marie Johansson filed Sep. 27, 1994, now abandoned which is a continuation-in-part of Ser. No. 891,549, now U.S. Pat. No. 5,351,007, by Richard S. Withers and Guo-Chun Liang filed Jun. 1, 1992, each of which is incorporated herein by reference.

INT-CL-ISSUED: [06] G01V 3/00

INT-CL-CURRENT:

TYPE IPC	DATE
CIPS <u>G01</u> R <u>33/36</u>	20060101

CIPS G01 R 33/34 20060101CIPS G01 R 33/32 20060101CIPS H01 G 4/40 20060101

US-CL-ISSUED: 324/318; 324/322

US-CL-CURRENT: 324/318; 324/322

FIELD-OF-CLASSIFICATION-SEARCH: 324/318, 324/321, 324/322, 29/829, 29/846, 29/847, 505/192, 505/202, 505/220, 505/329, 505/844

See application file for complete search history.

PRIOR-ART-DISCLOSED:

U.S. PATENT DOCUMENTS

PAT-NO	ISSUE-DATE	PATENTEE-NAME	US-CL
<u>4694283</u>	September 1987	Reeb	29/846
<u>5247256</u>	September 1993	Marek	324/321
<u>5258710</u>	November 1993	Black et al.	324/309
<u>5276398</u>	January 1994	Withers et al.	324/318
<u>5351007</u>	September 1994	Withers et al.	324/322
<u>5466480</u>	November 1995	Zhou et al.	505/844

FOREIGN PATENT DOCUMENTS

FOREIGN-PAT-NO	PUBN-DATE	COUNTRY	CLASS
WO94/05022	March 1994	WO	H1/H1G

OTHER PUBLICATIONS

Banson, et al., "A probe for specimen magnetic resonance microscopy" (Feb. 1992) Investigative Radiology 27:157-164.

Black, et al., "A high-temperature superconducting receiver for nuclear

magnetic resonance microscopy" (Feb. 5 1993) Science 259:793-795.

ART-UNIT: 225

PRIMARY-EXAMINER: Arana; Louis M.

ATTY-AGENT-FIRM: DeFranco; Judith A.

ABSTRACT:

A resonant coil for nuclear magnetic spectroscopy and microscopy is provided, in which the coil is in the form of nested, interrupted loops of a conductive material forming a distributed inductive element and having a plurality of capacitive elements with capacitance distributed over the periphery of the loops. The coil is preferably formed as a thin film of a superconductive material on an electrically nonconductive substrate.

7 Claims, 21 Drawing figures

Full	Title	Citation	Front	Review	Classification	Date	
Reference				Claims	KMC	Draw Desc	Image

☐ 6. Document ID: US 5258710 A

L13: Entry 6 of 6

File: USPT

Nov 2, 1993

US-PAT-NO: 5258710

DOCUMENT-IDENTIFIER: US 5258710 A

TITLE: Cryogenic probe for NMR microscopy

DATE-ISSUED: November 2, 1993

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Black; Robert D.	Charlton	NY		
Roemer; Peter B.	Schenectady	NY		
Mogro-Campero; Antonio A.	Niskayuna	NY		
Turner; Larry G.	Schenectady	NY		

ASSIGNEE-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY	TYPE	CODE
General Electric Company	Schenectady	NY				02

APPL-NO: 07/858924 [PALM]

DATE FILED: March 27, 1992

INT-CL-ISSUED: [05] G01R 33/20

INT-CL-CURRENT:

TYPE	IPC	DATE
CIPS	<u>G01 R 33/31</u>	20060101
CIPS	<u>G01 R 33/30</u>	20060101
CIPS	<u>G01 R 33/34</u>	20060101
CIPS	<u>F17 C 13/00</u>	20060101

US-CL-ISSUED: 324/309; 324/307

US-CL-CURRENT: 324/309; 324/307

FIELD-OF-CLASSIFICATION-SEARCH: 335/216, 335/299, 324/300, 324/307, 324/309, 324/318, 324/319, 324/320, 324/322

See application file for complete search history.

PRIOR-ART-DISCLOSED:

U.S. PATENT DOCUMENTS

PAT-NO	ISSUE-DATE	PATENTEE-NAME	US-CL
<u>4509030</u>	April 1985	Vermilyea	335/216
<u>4667174</u>	May 1987	MacKinnon et al.	335/299

<u>4694269</u>	September 1987	Burnett et al.	335/216
<u>4924185</u>	May 1990	Matsutani	324/319
<u>5136243</u>	August 1992	Starewicz et al.	324/318

OTHER PUBLICATIONS

R. Black, P. Roemer, W. Edelstein, S. Souza, A. Mogro-Campero and L. Turner, "Scaling Laws and Cryogenic Probes for NMR Microscopy", proceedings of the 10th Annual Conference of the Soc. of Magn. Reson., Aug. 10-16, 1991, p. 1250.

J. Johnson, "Thermal Agitation of Electricity in Conductors", Physical Review, vol. 32, Jul. 1928, pp. 97-109.

P. Styles, N. Soffe, C. Scott, D. Cragg, F. Row, D. White and P. White, "A High-Resolution NMR Probe in Which the Coil and Preamplifier are Cooled with Liquid Helium", Journal of Magnetic Resonance 60, pp. 397-404, 1984.

A. Hall, N. Alford, T. Button and D. Gilderdale, "Improvements in High Temperature Superconductor Receiver Coils", Proceedings of the 10th Annual Conference of the Soc. of Magn. Reson. in Med., Aug. 10-16, 1991, p. 725.

A. Mogro-Campero and L. Turner, "Lower Temperature Post-Annealing of Thin Films of YBa.sub.2 Cu.sub.3 O.sub.7 at Lower Oxygen Partial Pressure", Appl. Phys. Lett. 58(4), Jan. 28, 1991, pp. 417 and 418.

M. Reynolds, "Resonant Recombination of Atomic Hydrogen and Deuterium at Low Temperatures", Thesis, The University of British Columbia, Feb. 1989, pp. 35-40.

ART-UNIT: 267

PRIMARY-EXAMINER: Tokar; Michael J.

ATTY-AGENT-FIRM: Zale; Lawrence P. Snyder; Marvin

ABSTRACT:

An apparatus for microscopic imaging employing nuclear magnetic resonance is constructed from a cryogenic probe which is situated in a conventional magnetic resonance imaging system. The cryogenic probe employs a number of chambers and cryogenic liquids which cool a superconductor resonator to very low temperatures. A sample tube for containing a small specimen is heated to a temperature above its freezing point by flowing nitrogen gas over the specimen. A secondary resonant circuit is inductively coupled to the superconducting resonator. A transceiver passes RF signals to be transmitted into the specimen through the secondary resonant circuit causing the superconducting resonator to transmit the RF signal into the specimen.

The resonator then acts as a receive coil and receives a signal from the specimen which is inductively passed to the secondary resonator circuit from which an image is generated. The use of superconductors having low resistance and low temperatures causes noise to be significantly reduced, and the signal-to-noise ratio to be substantially increased.

20 Claims, 17 Drawing figures

Full	Title	Citation	Front	Review	Classification	Date
Reference			Claims	KMC	Draw Desc	Image

Clear	Generate Collection	Print	Fwd Refs	Bkwd Refs
Generate OACS				

Term	Documents
"5258710"	1
"5565778"	1
"5585723"	1
"5594342"	1
"5619140"	1
"6377047"	1
("5258710" "5565778" "5585723" "5594342" "5619140" "6377047")! [PN].USPT,PGPB.	6
(('5258710' '5565778' '5585723' '5594342' '5619140' '6377047')! [PN]).USPT,PGPB.	6

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